ProMatrix™ PM3180 Digitally Matrixed Amplifier

- Three Independent Amplifier Channels
- Unique Digital Interface
- Tremendous Flexibility

BOGEN®

When the Job is Demanding, the Installation doesn't have to be.

Bogen's **ProMatrix Model PM3180** is a three-channel amplifier designed specifically to address the needs of complicated sound installations. This product solves multi-input, multi-zone application problems by providing immense flexibility for audio control and distribution in a single package.

The heart of the ProMatrix is an analog signal processor and microprocessor which control audio level, equalization, compression, input routing, and power amplification.

Through easy-to-understand setup menus, the ProMatrix can be instructed to handle audio signals in ways that would normally require banks of equipment and complicated wiring schemes. It even includes a detachable front panel for the ultimate installation flexibility.

Even though the ProMatrix solves complicated audio installation problems, it is not complicated to use. It was created with the understanding that non-technical people will be the ones using the system long after the installation is complete. Operation is simple and intuitive because of its large, cleanly laid out control panel. However, the best part of having a ProMatrix PM3180 amplifier to manage a facility's audio is that you don't have to operate it at all.

The ProMatrix can be set to automatically switch input sources and apply preset levels for volume, bass, and treble as each prioritized input becomes active.

The ProMatrix uses a common set of inputs, but each channel has independent control over input priorities, volume, and EQ levels. For example, this ensures that when someone in a facility's bar area puts a dollar in a jukebox, the music comes on loud and heavy while the background music in the dining room stays calm and quiet.

For the installer, the PM3180 is about as easy to install as a home stereo. Simply plug in the audio input sources, wire the speaker load to the amplifiers and the system is up and running. The unit comes from the factory set so that you'll hear audio as soon as you press the power button. Then simply enter the password-protected programming mode and customize the system operation. The programming mode gives you access to numerous features that makes complicated installations a breeze.

The best part of having a ProMatrix to manage your facility's audio is that you don't have to operate it at all.

ProMatrix 3180 Front Panel

Infrared Remote Control Window

LED Level Meters: Amp Channels 1, 2, and 3

Control Panel Connections

ProMatrix 3180 Relocatable Control Panel

Audio Level Control Buttons and Position Pointer: Adjusts Level of Selected Function: VOL, BASS, TREB; Pointer Shows Approximate Level Setting

AUX Input Select Buttons for Manual Input Selection

Selects Manual of Automatic Input Switching Mode

Power Button

10 Character Alphanumeric Display Area

MIC Input Select Buttons for Manual Input Selection

Audio Function Select Determines Type of Audio Level to be Adjusted

Programming Buttons: Entering Password, Menu Selection, and Parameter Setting

Amplifier Selection Buttons: Selects the Amplifier to be Adjusted

ProMatrix 3180 Rear Panel

MIC A Input Connector (XLR)

Amplifier Channel Output Terminals

MIC B / TEL B Input

Contact Closure MIC Page Terminals

AUX Input Connections (RCA)

AUX Input Source Level Attenuators

Connectors for External Signal Processing

Data Cable Connection for Remote Mounting of Front Control Panel

Application Example

The following application example shows the ProMatrix in a typical medium-size restaurant. The ProMatrix controls a variety of input sources preprogrammed for the specific listening environment.

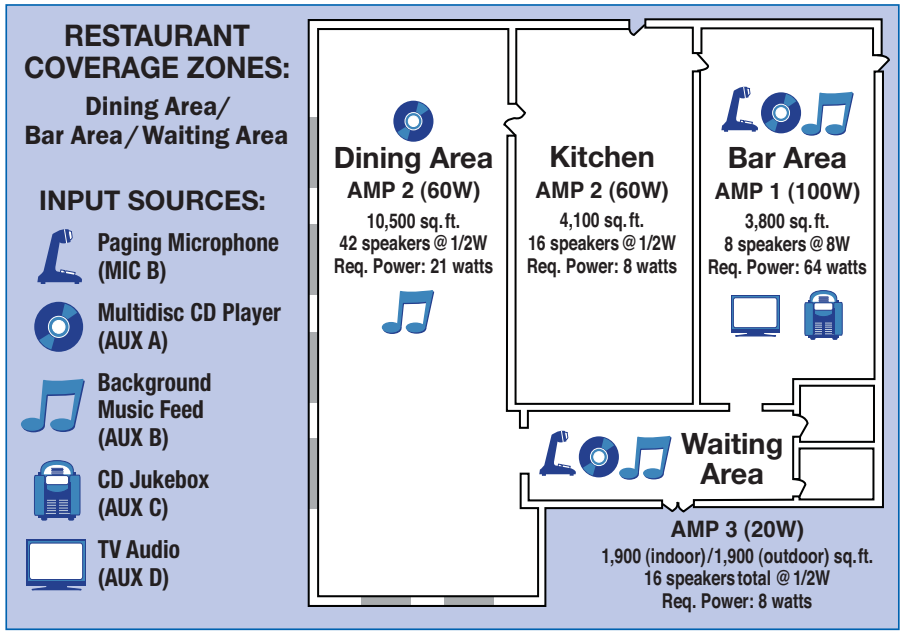
The chart below shows the speaker zones and input sources for this application. The Waiting and Dining Rooms use the same input sources, however the Bar will also use the TV audio and/or the jukebox. The plan is to use the CD changer as the primary music source in the Waiting and Dining Rooms with the background music feed as a backup.

A push to talk microphone will be used to page into the Bar and Waiting Area and will include variable music muting. The TV and jukebox are used only in the Bar. The jukebox is turned off whenever a special event is on the TV.

The bartender is allowed some control over the volume in the Bar, but a limit on the volume is necessary, and the jukebox is to be set to play somewhat louder than the BGM sources. The Waiting and Dining Room amps, once set, are not to be adjusted.

Coverage Zone Priority

	Dining Area (Amp 2)	Bar Area (Amp 1)	Waiting Area (Amp 3)
HIGH	CD	Mic	Mic
	BGM	JukeBox	CD
		TV Audio	BGM
		CD	
LOW		BGM	



ProMatrix Features & Controls

Assignable Input Priorities

Because the needs of different speaker zones can differ greatly, the ProMatrix provides a very flexible way of assigning priorities to the input sources. The 6 inputs of the ProMatrix are shared by all three channels but each channel can have a completely different order of input priorities. The only restriction on the order of priorities is that the microphone inputs must always be higher than AUX inputs.

Presets

A group of default parameters for each amplifier in the ProMatrix control the initial levels of volume, bass, and treble. This feature allows different equalization to be applied to each input source and different volume levels to be set for different inputs on the same amplifier. In this way certain inputs can be set to play at louder levels while others play softly. Also the difference in volume levels is maintained as the user raises and lowers the system volume.

Flexible Microphone Inputs

Both of the MIC inputs on the ProMatrix are low-impedance balanced inputs. Phantom power and automatic level control can be independently enabled for each input. The ProMatrix accommodates 3 different methods of activating a page: voice-activated (VOX), normally open, or normally-closed contact closure. One MIC input can be selected to operate as a 600-ohm transformer-balanced telephone paging input.

Volume Limiting

Many times it is desirable to allow the user the ability to adjust volume levels. However this also allows the user the freedom to push the level much louder than what may be acceptable to other listeners. The ProMatrix allows a limit to be placed on the volume level to which an amplifier channel can be raised. Limits can be set differently for each amplifier channel. For added flexibility, the inputs assigned to each amplifier channel can be set to a different limit.

Variable AUX Muting

The ProMatrix can be set to provide partial muting of AUX input signals during a page. The amount of muting applied to an AUX signal can be different depending on which microphone input is used to make the page. For example, MIC A – which is used for emergency announcements – can fully mute the AUX input level, while general paging MIC B is partially muted. For additional flexibility, each AUX input can be set to mute at a different level and they can be set differently for the different amplifier channels.

Tampering Protection

Because the ProMatrix can operate without the need for user intervention, it is sometimes desirable to inhibit the operation of the volume and tone controls of the amplifier to protect against tampering. Each amplifier channel can be independently inhibited and the volume or tone controls can be individually inhibited.

Labeling Inputs

The 10-character alphanumeric display on the control panel can be programmed to show the "label" or name of the input that is currently playing. The ProMatrix comes from the factory with default labels; however, these labels can be changed to ones that are more meaningful to the user, such as the name of the actual input device – CD PLAYER, TV, etc.

Audio Process Links

The ProMatrix provides audio processing capabilities that can satisfy most installations. However, audio processing links are provided on the PM3180 for each amplifier channel so that external signal processing devices can easily be added into the system. The links are switched through software commands so there are no slide switches to be tampered with or metal clips to be lost.

AUX Trim Controls

Input trim controls are provided to accommodate a wide range of auxiliary input signal levels (100mV to 2.5V).

Inputs/Outputs

The ProMatrix provides 2 MIC inputs, 4 AUX inputs, and 3 amplifier outputs. Power ratings are 100W, 60W and 20W. Output impedances match 4-ohm, 8-ohm, 25V, and 70V speaker systems. The 4-ohm output is a direct output from the amp, all others are transformer-isolated.

Detachable Control Panel

In many applications it is desirable to mount audio equipment in an out of the way place. However, this makes the operation of equipment difficult or inconvenient. The ProMatrix solves this problem by allowing its control panel to be removed and mounted in a more convenient location. The unit comes with wall mounting hardware and a 25 ft. data cord. An optional wall mount kit is available which allows in-wall wiring at a greater distances.

Automatic Operation

Even though the ProMatrix was designed to be easy to operate, its greatest benefit may be that it does not have to be operated at all. The ProMatrix is capable of completely autonomous audio system operation.

The ProMatrix can be set to switch inputs based on user assigned priorities. Volume, bass, and treble adjustments can be associated with each input. So when an input is switched in, the operating level will change with it. Users still have the ability to manually select an input which will defeat automatic operation.

Reinstating automatic operation is as simple as a single button push. All three amplifier channels work independently of each other so defeating automatic operation on one amp has no effect on the others.

Auto Switching

During the initial set up of the ProMatrix, different inputs can be assigned unique priorities. The ProMatrix continuously monitors the audio activity on all inputs. When it detects activity on an input with a higher priority than the current one, it immediately switches to it. When activity in a higher priority input stops for greater than 12 seconds, the next lowest priority active input will fade back in. The 12-second delay prevents the ProMatrix from switching during short pauses between songs. The microphone inputs switch back after 3 seconds of silence or immediately when using a contact closure to activate paging.

I/R Remote Control

The ProMatrix infrated remote control provides a convenient wireless means of control. All functions of the front control panel are accessible by the remote control. The receiving sensor is located on the front of the main unit.

Simple Hookup

The ProMatrix is no more difficult to hook up than a typical home stereo. Simply plug in input sources and then connect the speakers. The ProMatrix eliminates the complicated wiring between the various pieces of equipment normally required in sophisticated audio installs.

Simple Operation

System operation is simple and intuitive. The ProMatrix was designed from the start with the understanding that non-technical people may need to operate it. For this reason it was given a large, easy-to-understand front panel and made to operate like a home stereo.

Simple Setup

All configuration and set up adjustments are made through easy to use function menus. Access to the menus are protected by a password to protect against tampering.

Physical Installation

Installation begins by connecting the speaker loads and input signal cables to the rear of the unit. The PM3180 and input sources are then turned on and the AUX Trim Controls are adjusted to provide the correct signal level.

With these steps completed, you are now ready to set the system configuration. All selections and adjustments will be made through the push button controls of the front panel

System Configuration

To begin system configuration, enter the password to begin programming mode. Once entered, you can scroll through 10 different system configuration menus.

The first function to be configured is the microphone input.

The **MICROPHONE** menu allows the page activation method to be selected (VOX triggered, N.O. or N.C. contact closure). It also allows the Automatic Level Control and Phantom Power for the input to be enabled or disabled. For MIC B only, two different types of inputs (microphone or 600-ohm telephone) can also selected through this menu.

This application uses a push-to-talk condenser mic connected to the MIC B input terminal strip. MIC B is configured for normally opened contact closure activation, ALC enabled, and Phantom Power enabled. MIC A is not used so no changes are made to the factory settings.

The priorities of the different input sources are assigned using the **ASSIGNMENT** menu function. For the auto-switching ability of the ProMatrix to be of use to the system, some order of priority must be given to the different input sources. This will determine when one input overrides another. Because different zones have different requirements, each amplifier can have different input priority assignments. The *Coverage Zone Priority (on page 4)* defines the order of priority for the input sources for each speaker zone. An amplifier and input combination can also be assigned no priority, which effectively disconnects that input from the specific amplifier channel.

One note on priority setting: Microphone inputs can only be assigned the two highest priorities (1 or 2), AUX inputs can be assigned the 4 remaining lower priorities (3 to 6). So the PM3180 cannot be configured to allow an AUX input to override a microphone input.

For this application the desired amp/input combinations are given priorities that conform to the data in Coverage Zone Priority (on page 4). All unspecified amp/input combinations are given no priority.

The **PRESETS** menu provides a means to set the turn on levels for the volume, bass, and treble of the input sources for each amplifier channel. It also allows different inputs on the same amplifier channel to have different volumes. For example, the background music in the bar area plays at a low level until the higher priority jukebox comes on. This source then overrides the background music and the volume level increases significantly. When the jukebox finishes playing, background music returns, playing at its original level. The bass and treble functions work in a similar way and allow different equalization to be applied to the different input sources. These settings are also made through the **PRESET** function.

The adjustments are made while the PM3180 is playing the input source through the particular amp being configured. This makes it a simple matter to evaluate if the setting is producing the desired results.

One thing to be aware of is how the preset levels react when the user changes the volume, bass, or treble. When the user makes a change, it effects all the assigned inputs equally. Therefore increasing the level of the CD player by 3 volume steps will also make the jukebox 3 steps louder when it becomes active. Bass and treble respond in a similar fashion. In this way, the relative level differences that were preset between inputs remain intact.

In this application the CD player and background music feeds are set to play at the same low level on all amplifier channels. However, in the bar area, the TV is to be somewhat louder than the CD and the jukebox is to be set at a reasonable level for foreground music.

One of the requirements of this installation is to provide the bartender limited control over the volume in the bar area. This provision is made to ensure the volume levels can never be made so high as to annoy the patrons. Limiting output volume is accomplished using the **VOL LIMIT** menu feature.

The amplifier and input source to be limited is selected. The source will play at full volume when first selected because the factory set limit is full volume. As a precaution, because the input source can come on at full volume, the level ramps up over 2 seconds to give anyone close to a speaker time to react and protect their hearing. Now it's a simple matter of using the volume control buttons to

adjust the level to the desired maximum. Different input sources on the same amplifier can have different volume limit settings.

In this application we will set limits only in the bar area. For the background music and the CD player, the limits will be set at half the maximum. For the jukebox and TV, the level is set by ear to what the owner considers to be appropriate.

Two of the zones in this installation, the Waiting and Dining Rooms, are not to be adjusted by the user after the initial setup. To protect the system from tampering, the INHIBIT feature can be used. The volume, bass, and treble controls for each amplifier channel in the PM3180 can be individually inhibited from operating. Either the volume or bass and treble, or both can be inhibited from operating.

In this application we select AMP 1 and select ON for the volume inhibit. Selecting ON means that the inhibit feature is on, indicating that the associated control buttons don't operate. We select the same setting for AMP 3.

The PM3180 is capable of muting an AUX input source to a predetermined level while a page is in progress. Once the page has finished the AUX input will fade back to its original level. Setting the level to which the AUX input is suppressed is accomplished by using the AUX MUTE menu function.

To set this feature you must select the amplifier and input source combination to be adjusted. Also, for AUX mute level setting, you must select a microphone input. The PM3180 has the ability to mute an input source differently depending on which microphone input is being used. This ability is desirable in situations when one microphone is to be used for emergency announcements and another is for general paging. The PM3180 can be set to completely mute background music during emergency announcements, but only partial muting on normal pages.

Once the amplifier/input/MIC combination has been selected, it's only a matter of using the volume control buttons to adjust the AUX input mute level. The microphone is live while making this adjustment so the volume difference between the AUX input and microphone level signals can be evaluated. The microphone volume during this setup mode is the same as the PRESETS level and can not be adjusted.

In this application we set the muting levels in the bar and waiting area. The volume of the different input sources are each set to be approximately 10 dB lower than the microphone level.

The last step in this installation is to program the PM3180 to replace the default input display names with the name of the input source. The LABELS menu is used to customize the name of the 6 input sources. Names must be no more than 10 characters (A to Z, 0 to 9, -, /, or "space").

In this application we set the microphone input name to PAGE, the CD player to CD CHANGER, the background music service to BGM, the TV AUDIO and jukebox to JUKEBOX. You scroll through a list of available characters to select one so only a few buttons are used to edit the name.

Technical Specifications

Power Rating (RMS):	3 Independent amplifier channels rated at 100 watts (Amp 1), 60 watts (Amp 2), and 20 watts (Amp 3) RMS continuous
Frequency Response (AUX inputs):	
Transformer Outputs —	70Hz to 20kHz ±2dB (Amp 1 & 2), 100Hz to 15kHz ±2dB (Amp 3)
4Ω Direct —	20Hz to 20kHz ±2dB (Amp 1 & 2), 20Hz to 15kHz ±2dB (Amp 3)
Distortion:	Less than 0.5% (Less than 1% on Amp 3)
Signal-to-Noise Ratio:	-70dBr (Tel and Aux); -55dBr (Mic)
Inputs:	*MIC*: 2 Lo-Z balanced: MIC A has XLR-type connector, MIC B has screw terminal strip and can be configured as a 600-ohm transformer-balanced input for telephone paging applications *AUX*: 4 unbalanced AUX inputs via RCA jacks
MIC Precedence:	Via terminal strip. Programmable for Normally Open, Normally Closed or VOX
Outputs:	Separate terminal strips for each channel provides 4- and 8-ohm output and 25V and 70V taps
Tone Controls:	*Bass*: ±10dB @ 50Hz in 15 steps; *Treble*: ±10dB @ 15kHz in 15 steps
Preamp Out/Power Amp In:	Separate link for each channel permits insertion of signal-processing equipment
Controls:	Front-mounted, removable control panel with soft-touch buttons; Wireless infrared remote control
User Mode:	Permits control of volume, bass, treble, manual input selection
Programming Mode:	Password-protected mode permits setting of system functions
Thermal Emissions:	1051.9 BTU/hr.
Power Consumption:	430 watts
Dimensions:	17" W x 5-1/2" H x 14" D
Product Weight:	38 lbs.
Listing:	UL / ETL Listed

Accessories *(Sold Separately)*

RPK79
Rack Mounting Kit

RMPWMK3
Remote Wall Mounting Kit for Removable Front Panel

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